EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 05075951
PUBLICATION DATE : 26-03-93

APPLICATION DATE : 18-09-91
APPLICATION NUMBER : 03237531

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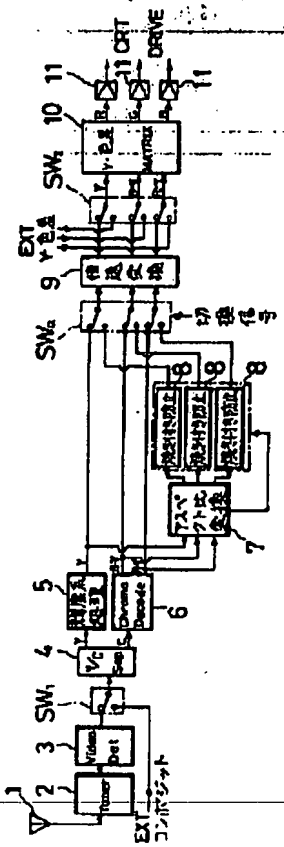
INT.CL. : H04N 5/46 H04N 5/66 H04N 7/01 // H04N 7/00

TITLE : TELEVISION RECEIVER



ABSTRACT : PURPOSE: To prevent the generation of burning by reducing a difference in brightness deterioration between an image section and a margine section as less as possible in the case of displaying a video signal having an aspect ratio different from that of a display screen.

CONSTITUTION: When a video signal having an aspect ratio different from that of the display screen is inputted, an aspect ratio conversion circuit 7 executes time compression or the like and a burning preventing circuit 8 inserts the average level value of the video signal into a margine section in which a valid video signal does not exist so that a difference in brightness deterioration between the image section and margine section of the display screen can be reduced as less as possible.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the television receiver suitable for the display of the image of a different aspect ratio from the aspect ratio of a display screen etc.
[0002]
[Description of the Prior Art] The television receiver constituted so that the image of a different aspect ratio from the television image by NTSC system, a PAL system, etc. could be conventionally displayed like the so-called high definition television receiver is proposed.
[0003] As are shown in drawing 6 , and the aspect ratio (aspect ratio) of the display screen has CRT of 16:9 and this television receiver shows (a) of drawing 6 , an aspect ratio projects the video signal of 16:9 using the whole surface of this display screen.
[0004] Moreover, it is constituted so that the video signal with which an aspect ratio differs from the display screen in this television receiver can also be displayed. For example, when an aspect ratio displays the video signal of 4:3, as shown in (b) of drawing 6 , the display screen is divided into the central image section L1 and the central margin section L2 of both sides, and an invalid video signal is projected for a video signal effective in the image section L1 at the margin section L2. And as this invalid video signal, the signal of fixed brightness, such as black level and a white level, was used.
[0005]
[Problem(s) to be Solved by the Invention] However, since the brightness of a video signal is [that it is not fixed and] indefinite, a steep brightness difference will be produced to the fixed brightness of the margin section. In CRT, the high current drive for high brightness reappearance caused degradation of a phosphor screen, and if the long duration brightness difference is changed into the condition, breadth and the so-called printing will produce [the difference of the degradation degree] it.
[0006] Then, this invention makes it a technical problem to offer the television receiver which lessened the difference of brightness degradation of the image section and the margin section as much as possible, and prevented printing.
[0007]
[Means for Solving the Problem] The television receiver concerning this invention for attaining the above-mentioned technical problem divides the display screen into the image section and the margin section, detects the signal level of said effective video signal in the television receiver which projects an invalid video signal for a video signal effective in said image section at said margin section, respectively, and carries out adjustable [of the signal level of said invalid video signal] based on this detection result.
[0008]
[Function] Since adjustable [of the brightness of the margin section] is carried out based on the signal level of the video signal displayed on the image section, the brightness difference of the image section and the margin section can be held small.
[0009]

[Example] Hereafter, the example of this invention is explained using a drawing. Drawing 1 thru/or drawing 5 show one example of this invention.
[0010] The circuit block of a television set is shown in drawing 1 , and, as for this television set, an aspect ratio has the display screen of 16:9. In drawing 1 , the input signal which received with the antenna 1 is led to a tuner 2, and the video signal of a request channel selection is taken out as the 1st intermediate frequency signal with a tuner 2. The video signal of this 1st intermediate frequency is returned to baseband in the video detector circuit 3, and is led to the 1st source change-over switch SW1.

[0011] The 1st source change-over switch SW1 switches alternatively the video signal from an antenna 1, and the video signal (composite signal) of an external input, and the selected video signal is divided into a luminance signal and a chroma signal in the Y/C separation circuit 4. Sharpness control, picture control, etc. are made in the brightness system processing circuit 5, and, as for the luminance signal, the luminance signal after processing is led to the aspect ratio change-over switch SWa. A chroma signal is returned to color-difference-signal B-Y and R-Y by the chroma decoder 6, and each of this color-difference signal is also led to the aspect ratio change-over switch SWa.
[0012] Moreover, the luminance signal of the brightness system processing circuit 5 and each color-difference signal of the chroma decoder 6 are supplied also to the aspect ratio conversion circuit 7, and signal processing of the aspect ratio conversion circuit 7 is carried out so that time amount compression etc. may carry out significant part of each signal and it may project using some display screens not by the aspect ratio (16:9) of the display screen but by the aspect ratio of the video signal concerned. To be shown in drawing 2 , an aspect ratio compresses in the direction of level Rhine in 3 / 4 hours, when the video signal of 4:3 is inputted. Each signal with which bit reduction etc. was carried out by the aspect ratio conversion circuit 7 is led to each printing prevention circuit 8. The detailed configuration of the seizure prevention circuit 8 is shown below, and each signal processed in each of this printing prevention circuit 8 is led to the aspect ratio change-over switch SWa.
[0013] The aspect ratio change-over switch SWa switches the signal which does not change an aspect ratio, and the changed signal alternatively, and each selected signal Y, B-Y, and R-Y are supplied to the **** conversion circuit circuit 9. The **** conversion circuit 9 has memory and once incorporates each input signal in this memory. And while reading the data for one line by a unit of 2 times, this read-out rate is outputted to the 2nd source change-over switch SW2 as twice [about] of drawing speed.
[0014] The 2nd source change-over switch SW2 switches alternatively the video signal (or composite signal of an external input) from an antenna 1, and the video signal (brightness, color-difference signal) of an external input, and the selected video signal is supplied to brightness and the matrix circuit 10 for the color difference. Brightness and the matrix circuit 10 for the color difference change brightness and a color-difference signal into the chrominance signal of R, G, and B, and each of this chrominance signal is outputted to CRT as a drive signal through each amplifier 11.
[0015] The circuit block diagram of said seizure prevention circuit 7 is shown in drawing 3 . In drawing 3 , an input video signal (shown in A of drawing 4 .) is led to a clamping circuit 20, and a clamping circuit 20 clamps the pedestal level of an input video signal to reference voltage Vref to the timing of the clamp pulse shown in B of drawing 4 . The video signal after a clamp is led to the signal selection circuitry 21 and the integrator 22, respectively.
[0016] An integrator 22 outputs the average level value of a video signal, and this integrator output (shown in D of drawing 4 .) is led to the signal selection circuitry 21 through the on/off switch SWb. An on/off switch SWb is controlled by the timing pulse from the aspect ratio conversion circuit 7, and is turned on only on H level. A timing pulse is L level in the image section of a display screen, and the detailed range [a little] narrower than the image section, as shown in C of drawing 4 , it is the signal of H level in the other section, and the average level signal of an integrator output is mostly inputted into the signal selection circuitry 21 only except the image section.
[0017] The signal selection circuitry 21 chooses a video signal and the signal of the inside of an integrator output, and a high level, and it outputs, and in the image section, since the average level signal of an integrator output is a high level, respectively, a video signal outputs a composite signal as shown

in E of drawing 4 in the margin section. Here, since a video signal and an average level signal overlap and consist of boundaries of the image section and the margin section, even if both signal timing shifts somewhat, a discontinuous part is not generated in the output signal of the signal selection circuitry 21, and a legible image can be projected.

[0018] The output signal of this signal selection circuitry 21 is led to a change-over switch SWc, and this change-over switch SWc switches alternatively the output signal and reference voltage Vref of the signal selection circuitry 21 based on the composite blanking pulse shown in F of drawing 4 . When a composite blanking pulse is H level, from a change-over switch SWc, the video signal which made the clamp section pedestal level as shown in G of drawing 4 is outputted by choosing the output signal of the signal selection circuitry 21 for reference voltage, respectively at the time of L level.

[0019] It is burned on drawing 5 and the concrete circuit diagram of the prevention circuit 8 is shown. In drawing 5 , the same sign is given to the part corresponding to drawing 3 , and the explanation is omitted.

[0020] Hereafter, an operation of the above-mentioned configuration is explained. In drawing 1 , it is a video signal from a tuner 2, and when an aspect ratio projects the video signal of 16:9, it is located in the selected position which the 1st and 2nd source change-over switches SW1 and SW2 and the aspect ratio change-over switch SWa show to drawing 1 . Then, the video signal tuned in with the tuner 2 inputs into the Y/C separation circuit 4 through the 1st source change-over switch SW1, and the video signal which passed along the brightness system processing circuit 5 and the chroma decoder 6 after the Y/C separation circuit 4, respectively is led to the **** conversion circuit 9 through the aspect ratio change-over switch SWa as it is. The video signal changed into 2X is changed into the chrominance signal of R, G, and B through the 2nd source change-over switch SW2 in brightness and the matrix circuit 10 for the color difference, and it projects a video signal using the whole surface of the display screen.

[0021] Moreover, when the aspect ratio received with the tuner 2 projects the video signal of 4:3, it considers as a location opposite to the selected position which shows only the aspect ratio change-over switch SWa to drawing 1 . Then, what the luminance signal of the brightness system processing circuit 5 and the color-difference signal of the chroma decoder 6 were burned with the aspect ratio conversion circuit 7, and passed along the prevention circuit 8 is chosen with the aspect ratio change-over switch SWa. Therefore, while compression etc. is carried out by the aspect ratio conversion circuit 7 for 3 / 4 hours, as for a luminance signal and each color-difference signal, the average level value of each signal is inserted in the margin section when the effective video signal in each printing circuit 8 stopped existing. And each signal transformed in this way is led to brightness and the matrix circuit 10 for the color difference through the **** conversion circuit 9 and the 2nd source change-over switch SW2. Since it is an average level value, as for all the margin sections of each signal, the chrominance signal of R, G, and B which were changed in brightness and the matrix circuit 10 for the color difference also shows average level. And as shown in (b) of drawing 6 , the display screen is divided into the effective section L1 and the margin section L2, the effective section L1 projects a video signal, and the margin section L2 projects the average level signal of a video signal, respectively. Since this average level signal changes based on a video signal and produces only a brightness difference always loose in the effective section and the margin section, printing does not produce it by use of long duration, either.

[0022] In addition, although the average level signal was inserted in each margin section about luminance signals and each color-difference signals of all in this example, an average level signal may be inserted only in a luminance signal, it can be burned not in the processing phase of a luminance signal and each color-difference signal but in the processing phase of the chrominance signal of R, G, and B, and prevention processing may be performed. In this case, all three colors may be followed and one color of arbitration or two colors may be followed. Furthermore, although the average level signal was inserted in the margin section, you may constitute so that not an average level signal but the level signal near it may be inserted. This is suitably carried out under harmony with the size of a brightness difference, and the conspicuousness of a screen. Although the time constant of an integrator 22 is set up in this example so that it may become the average of the 1 level section, you may set up so that it may become the average of the 1 perpendicular section, and a time constant is suitably determined further

again according to a case.

[0023] In addition, although this example showed the case where the video signal with which an aspect ratio differs from the display screen was displayed, and an aspect ratio is the same, also when projecting using some display screens, it can apply.

[0024]

[Effect of the Invention] In the television receiver which according to this invention divides the display screen into the image section and the margin section, and projects an invalid video signal for a video signal effective in said image section at the margin section, respectively as stated above Since the signal level of said effective video signal was detected and it carried out adjustable [of the signal level of said invalid video signal] based on this detection result, the brightness difference of the boundary of the image section and the margin section becomes loose, and the effectiveness that baking does not arise by use of long duration, either is done so.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The circuit block diagram of a television receiver (example).
[Drawing 2] Drawing showing the time amount compression ratio of a video signal (example).
[Drawing 3] The circuit block diagram of a seizure prevention circuit (example).
[Drawing 4] Timing diagram Fig. (example).
[Drawing 5] The circuit diagram of a seizure prevention circuit (example).
[Drawing 6] For (a), (b) is drawing showing the case where it displays using some display screens when displaying using the whole surface of the display screen, respectively.

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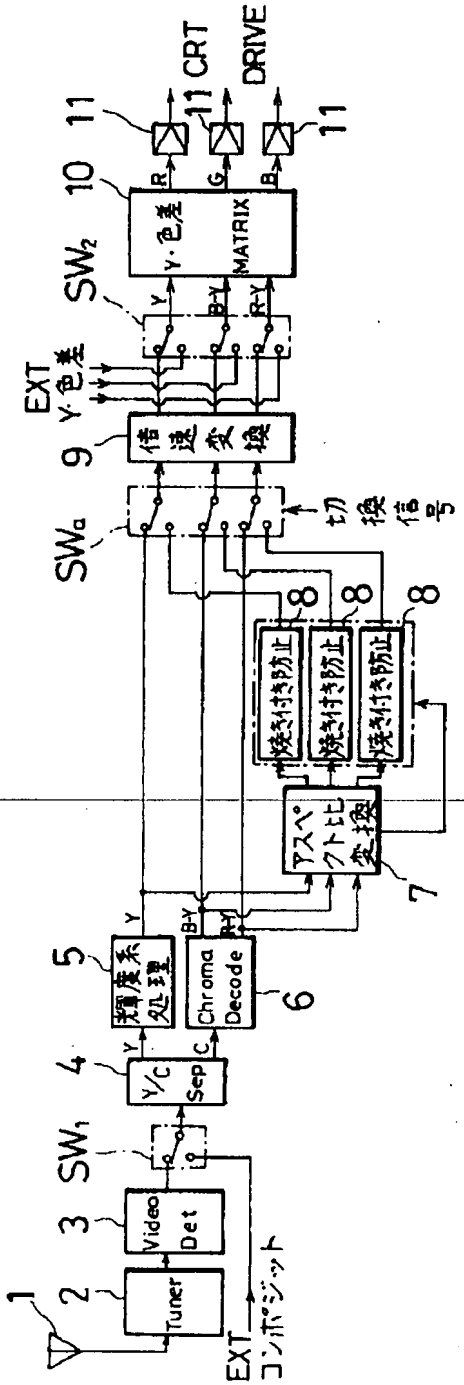
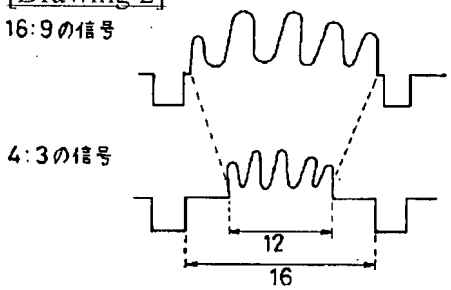
DRAWINGS

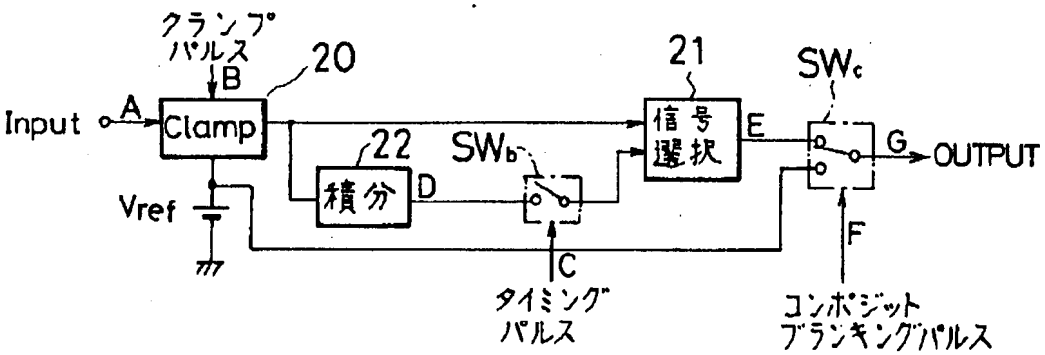
[Drawing 1]



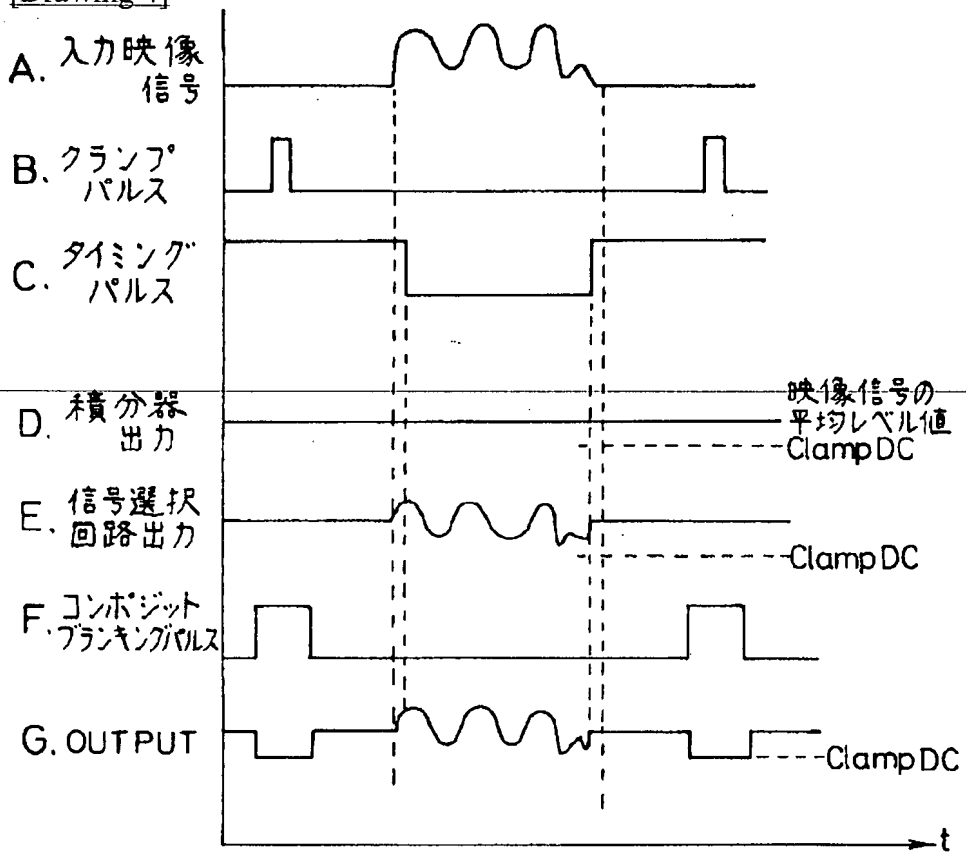
[Drawing 2]



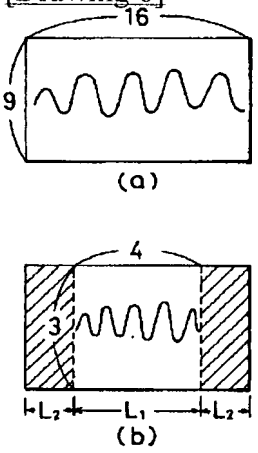
[Drawing 3]



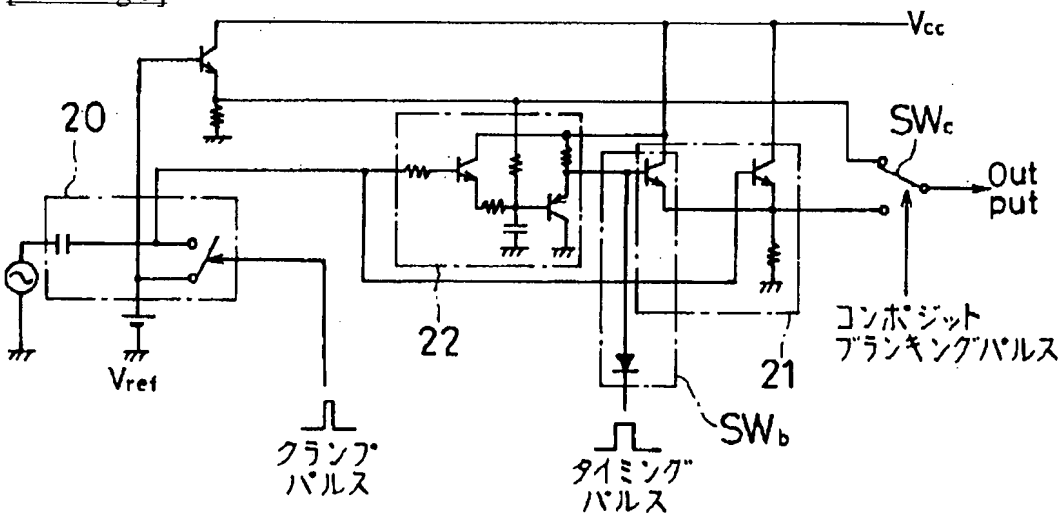
[Drawing 4]



[Drawing 6]



[Drawing 5]



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